We Claim:

1. A method for improving the stage-to-stage performance of a message in a multi-stage message campaign in an interactive measurable medium; said method including steps of:

(a) reading prior stage message state pertaining to a prior stage in a message campaign; said prior stage message state including a cumulative number of trials and a cumulative number of successes for a particular (i^{th}) message at the end of said prior stage;

(b) reading message performance results representing message trials and message successes from said previous stage based on said prior stage state;

(c) computing a current message state on the basis of said prior stage message state and said message performance results; and

(d) generating a current message allocation based on said current message state.

2. The method in claim 1, wherein said method further comprising step of:

(e) storing said current message state as prior stage state for a next iteration of said method.

3. The method in claim 1, wherein said cumulative number of trials and said cumulative number of successes comprise discounted cumulative number of trials and discounted cumulative number of successes.

4. The method in claim 1, wherein said prior stage message state comprises reading a state vector for the previous stage in a message campaign.

5. The method in claim 1, further comprising the step of storing said initial state vector in a database.

6. The method in claim 1, wherein said step of generating a current message allocation further includes applying a message allocation constraint.

7. The method in claim 1, further including the step of storing said current message allocation in a database.

8. The method in claim 2, further including repeating steps (a)-(e) for each stage in said message campaign.

9. The method in claim 1, wherein said message comprises a web banner ad.

10. The method in claim 1, wherein said message comprises an email.

11. The method in claim 1, wherein said method further comprising steps of:

(e) storing said current message state as prior stage state for a next iteration of said method; and

(f) repeating steps (a)-(e) for each stage in said message campaign;

said cumulative number of trials and said cumulative number of successes comprise discounted cumulative number of trials and discounted cumulative number of successes;

said prior stage message state comprises reading a state vector for the previous stage in a message campaign;

said step of generating a current message allocation further includes applying a message allocation constraint; and

said message selected from the group of messages consisting of an advertisement, an email, and combinations thereof.

12. The method in claim 1, wherein said message state is updated at the end of each state of a message campaign to reflect the performance results of that stage.

13. The method in claim 1, wherein said message state stores information that has been collected on a given message.

14. The method in claim 1, wherein said message comprises an advertisement, and said state stores all of the information that has been collected for said advertisement.

15. The method in claim 1, wherein said message comprises an internet web site banner advertisement and said state stores all information that has been collected for said banner advertisement at a given zone.

16. The method in claim 1, wherein said message comprises an email message and said state stores all of the information that has been collected for said email message.

17. The method in claim 1, wherein said message comprises a banner advertisement and a constraints list stores any constraints on the allocation of banner ads to impressions.

18. The method in claim 1, wherein said constraints includes a minimum number of banners to be retained at each stage of an ad campaign and the identity of particular banners to be excluded from any zones.

19. The method in claim 1, wherein said constraints stores a list of any constraints on the allocation of messages.

20. The method in claim 1, wherein said step of (b) of reading message performance results further comprises storing said performance results of the most recent stage of the message campaign in a results vector.

21. The method in claim 20, wherein said message comprises an advertisement, and said results vector stores the results of the most recent stage of the advertising campaign.

22. The method in claim 1, wherein said step (d) of generating a current message allocation further comprises storing a current message allocation into an allocations vector.

23. The method in claim 22, wherein said allocations vector stores an allocation of banners to available impressions for a future stage in the campaign.

24. The method in claim 23, wherein said allocations vector stores an allocation of messages to available trials for a future stage in the campaign.

25. The method in claim 24, wherein said future stage is a next stage.

26. The method in claim 1, wherein said step (d) of generating a current message allocation uses performance results form all prior stages in the message campaign.

27. The method in claim 1, wherein said step (d) of generating a current message allocation uses performance results form at least one prior stage in the campaign.

28. The method in claim 1, wherein said step (d) of generating a current message allocation uses results form a predetermined number of the most recent prior stages in the campaign.

29. The method in claim 1, wherein said step (d) of generating a current message allocation uses weighted results from a predetermined number of the most recent prior stages in the campaign so that more recent results are weighted more heavily than older results.

30. The method in claim 1, wherein when multiple zones are possible for a message, and said steps (a)-(d) are applied separately for each zone on a zone-by-zone basis.

31. The method in claim 1, wherein said performance results are discounted when computing said current state vector.

32. The method in claim 31, wherein said discounting is in the form of a binary step function where performance data older than a certain stage is ignored and performance data newer that a particular stage is considered equally.

33. The method in claim 31, wherein said discounting is in the form of a weighting function wherein newer performance data is weighted more heavily than older performance data.

34. The method in claim 33, wherein said weighting function is linear function of stage.

34. The method in claim 33, wherein said weighting function is non-linear function of stage.

35. The method in claim 31, wherein said discounting comprises geometrical discounting where at each stage each performance data is discounted according to a geometrical discounting function.

36. The method in claim 35, wherein said geometrical discounting comprises multiplying each performance result at each stage by a number of one-stage discount factors ß, where ß is less-than-or-equal-to 1 ($ß \leq 1$), corresponding to the number of stages, such that performance data that is n stages old at the time of execution are multiplied by ß raised to the n power ($ß^n$).

37. The method in claim 36, wherein the one-stage discount factor $ß < 1$.

38. The method in claim 36, wherein where ß is in the range between about 0 and about 0.99.

39. The method in claim 36, wherein where ß is in the range between about 0.5 and about 1.0.

40. The method in claim 36, wherein where ß is in the range between about 0.8 and about 1.0.

41. The method in claim 36, wherein where ß is in the range between about 0.85 and about 0.95.

42. The method in claim 36, wherein where ß is substantially 0.9.

43. The method in claim 1, wherein said message is a banner ad, and said state comprises a state vector having a first state vector component $s_i(t)$ for the total number of discounted cumulative clicks for banner i at the end of stage t, and a second state vector component $n_i(t)$ for the cumulative number of impressions for banner i at the end of stage t.

44. The method in claim 43, wherein:

$s_i(t) = ß\ s_i(t-1) + click_i(t-1)$, for $t \geq 2$;

$n_i(t) = ß\ n_i(t-1) + imp_i(t-1)$, for $t \geq 2$; and

$s_i(1) = 0$ and $n_i(1) = 0$; and

where:

$imp_i(t)$ is the total number of impressions for banner i in stage t;

$click_i(t)$ represent the total number of clicks for banner i in stage t; and

ß is a one stage discounting factor.

45. The method in claim 44, wherein $ß \leq 1$.

46. The method in claim 43, wherein said state comprises a first state vector component $s_i(t)$ for the total number of discounted cumulative clicks for message i at

the end of stage t, and a second state vector component $n_i(t)$ for the cumulative number of impressions for banner i at the end of stage t.

47. The method in claim 46, wherein:

$s_i(t) = G\{ click_i(1), \ldots, click_i(t-2), click_i(t-1) \}$, for $t \geq 2$; and

$n_i(t) = G\{ imp_i(1), \ldots, imp_i(t-2), imp_i(t-1) \}$, for $t \geq 2$;

where $s_i(1) = 0$ and $n_i(1) = 0$; and

where:

$imp_i(t)$ is the total number of impressions for banner i in stage t;

$click_i(t)$ represent the total number of clicks for banner i in stage t; and

$G\{\ldots\}$ is a discounting function.

48. The method in claim 47, wherein $G\{\ldots\}$ is a geometric discounting function.

49. The method in claim 1, wherein at each stage the available messages are partitioned into a first group of contending messages that remain in contention to become the best performing message, and a second group that are not in contention to become the best message.

50. The method in claim 49, wherein said message comprises a banner ad.

51. The method in claim 49, wherein said message comprises an email.

52. The method in claim 49, wherein the available messages are further partitioned into a third group of unavailable messages for messages constrained not to be used on the given zone during a particular stage.

53. The method in claim 49, wherein each of said contender group, said non-contender group, and said unavailable group may have none, one, or a plurality of members.

54. The method in claim 49, wherein a first proportion (γ) of the total available impressions are allocated to non-contenders at each stage and a second proportion (1-γ) of the total impressions are allocated to contenders at each stage, at the beginning of a campaign.

55. The method in claim 49, wherein the alternatives for each message are compared on a pair-wise basis to the alternatives for each other message to determine the better performing of the two pair-wise compared messages

56. The method in claim 55, wherein the message comprises a banner ad.

57. The method in claim 55, wherein the message comprises an email.

58. The method in claim 57, wherein the email message includes an attachment.

59. The message in claim 55, wherein if a particular banner loses one of these pair-wise comparisons by having a significantly lower success rate than another banner, then that banner is designated as a non-contender.

60. The method in claim 55, wherein said pair-wise procedure guarantees that at least one contender will remain.

61. The method in claim 1, wherein said message is selected from the group of messages consisting or an advertisement, an internet web site banner ad, an email, an email advertisement, an email having ad advertisement attachment, a solicitation, an interactive television message, and combinations thereof.

62. The method in claim 1, wherein for providing more than two groups of alternatives, the alternatives are divided into multiple sets based on a performance value.

63. The method in claim 62, wherein the number of impressions allocated to all alternatives within a set are equal and the number of sets are equal to the number of alternatives.

64. The method in claim 1, wherein the state comprises a first state vector component $s_i(t)$ for the total number of discounted cumulative successes for message i at the end of stage t, and a second state vector component $n_i(t)$ for the cumulative number of trials for message i at the end of stage t.

65. The method in claim 64, wherein:

$s_i(t) = H\{ success_i(1), \ldots, success_i(t-2), success_i(t-1) \}$, for $t \geq 2$; and

$n_i(t) = H\{ trial_i(1), \ldots, trial_i(t-1), trial_i(t-1) \}$, for $t \geq 2$;

where $s_i(1) = 0$ and $n_i(1) = 0$;

$success_i(t)$ is the number of successful outcomes for message i at stage t;

$trial_i(t)$ is the number of trials of message i at stage t; and

$H\{\ldots\}$ is a functional operator of the bracketed parameters.

66. The method in claim 65, wherein $H\{\ldots\}$ comprises a weighting function of trials and successes.

67. The method in claim 65, wherein $H\{\ldots\}$ comprises a geometric discounting function wherein newer state data is counted more heavily than older state data.

68. The method in claim 54, wherein said first proportion (γ) of the total available impressions is between about 0 and about 0.5.

69. The method in claim 54, wherein said first proportion (γ) of the total available impressions is between about 0.01 and about 0.05.

70. The method in claim 54, wherein said first proportion (γ) of the total available impressions is between about 0.02 and about 0.03.

71. The method in claim 55, wherein said pair-wise comparison determines relative success rates for the two message alternatives banners under consideration utilizing a cutoff threshold value α.

72. The method in claim 71, wherein said cutoff threshold value α is a value between about 0.5 and about 1.0.

73. The method in claim 71, wherein said cutoff threshold value α is a value of about 1/2.

74. A computer program for use in conjunction with a computer system, the computer program comprising a computer program mechanism embedded therein, the computer program mechanism, comprising:

a program module that directs the computer system to improving the stage-to-stage performance of a message in a multi-stage message, the program module including instructions for:

(a) reading prior stage message state pertaining to a prior stage in a message campaign; said prior stage message state including a cumulative number of trials and a cumulative number of successes for a particular message at the end of said prior stage;

(b) reading message performance results representing message trials and message successes from said previous stage based on said prior stage state;

(c) computing a current message state on the basis of said prior stage message state and said message performance results; and

(d) generating a current message allocation based on said current message state.

75. The computer program in claim 74, wherein said program module further including instructions for:

(e) storing said current message state as prior stage state for a next iteration of said method.

76. The computer program in claim 74, wherein said cumulative number of trials and said cumulative number of successes comprise discounted cumulative number of trials and discounted cumulative number of successes.

77. The computer program in claim 74, wherein said prior stage message state comprises reading a state vector for the previous stage in a message campaign.

78. The computer program in claim 74, wherein said step of generating a current message allocation further includes applying a message allocation constraint.

79. The computer program in claim 74, wherein said program module further includes instructions for repeating steps (a)-(e) for each stage in said message campaign.

80. The computer program in claim 74, wherein said program module further includes instructions for:

(e) storing said current message state as prior stage state for a next iteration of said method; and

(f) repeating steps (a)-(e) for each stage in said message campaign;

said cumulative number of trials and said cumulative number of successes comprise discounted cumulative number of trials and discounted cumulative number of successes;

said prior stage message state comprises reading a state vector for the previous stage in a message campaign;

said step of generating a current message allocation further includes applying a message allocation constraint; and

said message selected from the group of messages consisting of an advertisement, an email, and combinations thereof.

81. The computer program of claim 74, further comprising a tangible computer readable storage medium wherein the computer program is stored on the tangible computer readable storage medium.

82. The computer program of claim 81, wherein said tangible computer readable storage medium is a medium selected from the group consisting of a magnetic storage medium, a solid-state memory device, an optical storage medium, a CD-ROM disk, a DVD disc, a floppy-disc, and combinations thereof.

83. A computer system comprising:

a server having a processor and a memory coupled to said processor;

an internet interface means for coupling said processor to the internet;

means for receiving performance results from a message service coupled to said internet;

means for transmitting a message allocation to said message service;

a message optimization procedure implemented as a computer program and comprising a computer program mechanism embedded therein and stored in said memory and executing in said processor;

said computer program mechanism, comprising a program module that directs the computer system to improving the stage-to-stage performance of a message in a multi-stage message, the program module including instructions for:

(a) reading prior stage message state pertaining to a prior stage in a message campaign; said prior stage message state including a cumulative number of trials and a cumulative number of successes for a particular message at the end of said prior stage;

(b) reading message performance results representing message trials and message successes from said previous stage based on said prior stage state;

(c) computing a current message state on the basis of said prior stage message state and said message performance results; and

(d) generating a current message allocation based on said current message state.